

Examinations

Microscopic Anatomy, AP 710

Exam 1, Part B, 34 points

Connective tissue, cartilage, bone and epithelium
September 15, 2000

Please use the answer sheet provided on the last page to record your answers. For questions with more than one response, be sure to enter the answers IN THE CORRECT ORDER on the answer sheet. **Be sure to put your name and box number on the answer sheet.** You may keep this test.

Short Answer (2 points each):

1. Define the following terms:
 - a. endochondral ossification **formation of bone by replacement of cartilage tissue with bone tissue**
 - b. appositional growth **deposition of layers of tissue; new tissue is added to a pre-existing surface**
 - c. adenocarcinoma **a tumor arising from glandular or gland-like tissue**
2. Describe the difference between immature bone (a.k.a. woven or primary bone) and mature bone (a.k.a. lamellar or secondary bone). **Immature bone is randomly organized, and has not yet been remodeled into the layers typical of mature bone**
3. Describe how you could tell the difference between a piece of tendon and a piece of fibrocartilage using your light microscope. **tendon: large collagen fibers, flattened fibrocytes, collagen regularly arranged; fibrocartilage: see ground substance and chondrocytes in lacunae, fibers often in herringbone pattern**

Multiple choice and fill-in-the-blank (1 point per response):

4. Which of the following lists contains cells that are all associated with the mononuclear phagocyte system?
 - a. **monocyte, Kupffer cell, osteoclast**
 - b. osteoblast, pericyte, Kupffer cell
 - c. histiocyte, fibrocyte, osteocyte
 - d. macrophage, plasma cell, PMN
5. The ground substance of articular hyaline cartilage resists compressive forces. Which of the following is responsible for the ability of hyaline cartilage ground substance to resist compression?
 - a. The collagen fibers are large and are arranged perpendicular to the compressive forces.
 - b. The chondrocytes are arranged such that their cell processes are attached by desmosomes, thus strengthening the tissue.
 - c. **The complex three-dimensional structure and water-binding properties of the component proteoglycans and glycosaminoglycans.**
 - d. Hyaline cartilage matrix is mineralized to resist the weight-bearing forces in the joint.

- e. Both A and C are true.
f. All of the above are true.
6. Which of the following cell types gives rise to the osteoblasts that form the bone collar, the first event in a primary center of ossification?
- fibroblasts of periosteum**
 - chondrocytes in the cartilage model
 - macrophages associated with blood vessels
 - None of the above.
7. "Endothelium" is
- the epithelium lining a body cavity.
 - the parenchyma of a gland.
 - the secretory portion of a gland.
 - the lining of a blood vessel.**
 - the lining of a duct within a gland.
8. In which type of cell junction are the outer layers of the two adjacent cells fused together?
- occluding junction**
 - adhering junction
 - desmosome
 - gap junction
9. Which of the following contain actin microfilaments?
- microvilli
 - stereocilia
 - centrioles
 - cilia
 - A and B**
 - C and D
10. The cells responsible for the maintenance of the tendon tissue are called **fibrocytes**. These cells are highly (differentiated, undifferentiated) (**choose one**).
11. When studying a section of connective tissue stained with hematoxylin and eosin, you can determine that the collagen is (acidic, **basic**) (**choose one**) because the eosin component of the dye binds to collagen. In ordinary connective tissue, the ground substance (is, **is not**) (**choose one**) visible in a stained section.
12. The connective tissue of the small intestine (the name of which is lamina propria), has the following characteristics: sparse and randomly arranged collagen fibers with much space in between them for ground substance, and a population of cells consisting of fibroblasts and a large number of transient cells belonging to the defensive system. This connective tissue is classified as loose (**collagenous**) _____ connective tissue.

13. Loose connective tissue can have many different types of cells, both transient (wandering) and fixed. One cell, the mast cell, is usually located in the connective tissue near a vessel, and it releases compounds that are vasoactive. Another cell, the neutrophil (PMN) cell, has a multi-lobed nucleus, moves freely between the vascular system and the connective tissue as needed, and functions as a macrophage on a small scale, removing such things as bacteria and inflammatory waste material, and forming pus.

Matching (1 point per response):

14. Match the following terms on the left with an appropriate definition on the right:

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| <u>D</u> stratum granulosum | a. Newly secreted, unmineralized bone matrix produced by osteoblasts. |
| <u>L</u> isogenous group | b. Undifferentiated connective tissue found in the embryo, and capable of differentiating into many other tissue types. |
| <u>G</u> hemidesmosome | c. Describing an oily or fatty secretion of certain glands of the skin. |
| <u>C</u> sebaceous | d. One of the layers in keratinized stratified squamous epithelium. |
| <u>J or O</u> apocrine | e. Describing the appearance of the chondrocytes in the zone of hypertrophy of the physis. |
| <u>H</u> occluding (tight) junction | f. Describes a cell that is formed from the fusion of several other cells; examples are skeletal muscle and osteoclasts. |
| <u>A</u> osteoid | g. A type of cell-connective tissue junction found at the basal surface of epithelial cells. |
| <u>B</u> mesenchyme | h. A type of cell-cell junction commonly found near the apical surface of adjacent epithelial cells. |
| <u>F</u> syncytium | i. The zone of the physis in which granular osteoclasts are removing calcified cartilage. |
| <u>K</u> osteon | j. Literally means "to separate from"; type of secretion in which a portion of the secretory cell pinches off with the secretion. |
| <u>P</u> endosteum | k. A unit of bone consisting of concentric lamellae of bone surrounding a central, or Haversian, canal. |
| | l. A cluster of chondrocytes sitting close together with little matrix between their lacunae. |
| | m. Woven bone; bone that is mineralized, but not deposited in layers. |
| | n. A zone of fusion of cell membranes between epithelial cells, physically preventing substances from moving into the intercellular space between the epithelial cells. |
| | o. Describing the secretory product of sweat glands found in hairy skin. |
| | p. The delicate connective tissue lining the marrow cavity. |